



## NOTES ON VANCOUVER ISLAND.

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THERE is, perhaps, no other island of its size in Queen Victoria's broad dominions which possesses as much interest at the present time, in relation to the Empire, as does Vancouver Island. Situated on the north-west coast of America, and occupying a position on the Pacific coast analogous to that of the British Isles on the coast of the Atlantic, it extends in a north-westerly direction parallel to the mainland, from the south-east, for a length of about 300 miles, with a breadth varying from 20 to 60 miles. The capital of the Province of British Columbia, Victoria, is situated near the east end of the island. It is connected by an electric railway with the town of Esquimalt and its commodious harbour, the naval station of the North Pacific.

The west coast of the island is indented by deep inlets, or canals as they are sometimes termed. One of these, the Alberni Canal, extends from Barclay Sound for over 20 miles into the interior, and is of sufficient depth along the whole distance to float the largest ships of the navy. Another inlet, also navigable by the largest ocean-going vessels, begins at Quatsino Sound, and crosses the island to within 7 miles of the eastern coast near Fort Rupert, so named by the Hudson Bay Company in honour of Prince Rupert.

Noctka Sound, near the centre of the island on the west side, first became celebrated by the arrival there of Captain Cook in 1778, on his third voyage around the world. The natives received him kindly. He

remained in the Sound only a short time to make some repairs to his vessels, and left under the impression that the coast was a portion of the mainland.

Soon after the report of Captain Cook's discoveries became known, and it was learned that valuable furs could be obtained in abundance from the natives of the north-west coast, traders of various nationalities began to arrive in ships flying the flags of their respective nations. The trade with the natives, chiefly for sea-otter skins, increased rapidly, and Nootka became the chief rendezvous of the various traders.

In 1788 John Meares, formerly a lieutenant in the British navy, arrived at Nootka with two trading vessels from China. He met with a friendly reception from the natives, and agreed with the Indian chiefs for the purchase of lands on which to establish a station for trading purposes and shipbuilding. Having erected suitable buildings on the land thus obtained, he returned with his vessels and furs to China, leaving instructions with skilled men as to the building of a vessel to be named the *North-West America*. In due time the vessel was built and launched. When Captain Meares returned on his second voyage, he found that a Spanish fleet had come north from the west coast of Mexico and captured the newly built vessel, had robbed his stores, taken his men prisoners, and destroyed his buildings. This outrage he reported to the British Government, and in consequence a convention was held at Madrid in 1790.

After much diplomatic correspondence between the courts of Great Britain and Spain—France, her ally, having proposed to join against Great Britain—the imbroglio, which almost led to war, ended in Spain agreeing to pay compensation to Captain Meares and his party (British subjects) for the losses and damage resulting from the seizure of his vessels and property in 1789. Commissioners were appointed by Spain and Great Britain to define the amount of the claim. They met at Whitehall, London, in February 1793, and decided that Spain should pay an indemnity of \$210,000 in coin, in full settlement of all claims. It had formerly been agreed by the convention at Madrid that the Spaniards should evacuate Nootka. This in due time was carried into effect.

Captain George Vancouver, in 1790, was commissioned by the British Admiralty to see that the agreements with Spain were fully complied with; also to make explorations and surveys along the north-west coast of America; and to finally set at rest the question of a navigable passage between the Atlantic *via* Hudson's Bay and the Pacific Ocean. He arrived at the Straits of Fuca, April 1792. Proceeding along the Straits until the large opening leading southward was reached, he turned in that direction and surveyed those wonderful inlets, naming them Puget Sound, after his second lieutenant, Peter Puget, who had principal charge of that survey. Then proceeding northward, surveying as he went, he sailed westward around the north-westerly point of the island, and thence south-easterly until Nootka was reached, where he found Governor Quadra.

With the Spanish Governor Vancouver discussed the situation fully. On the one hand, Vancouver had instructions to receive from Quadra, in accordance with the Madrid convention, the buildings and tracts of land of which British subjects had been dispossessed in 1789. On his part, Quadra desired delay, as he had not received special instructions from his Government on the subject.

It was therefore agreed between them, that the whole matter relative to the transfer should remain in abeyance until further instructions were received; and that, in the meantime, the large island which Vancouver had just circumnavigated, should be named "Quadra and Vancouver Island." Quadra and his fleet left Nootka on 22nd September 1792 for his Mexican headquarters at San Blas. He died the following March. Vancouver left Nootka on the 12th of October for the Sandwich Islands, where he wintered.

Early in the summer of 1793, Vancouver returned to complete his explorations and surveys along the mainland. He called at Nootka, but received no despatches from England. He completed his surveys during the summer as far as Portland Canal and Clarence Strait, examining also Prince Ernest Sound, and, returning south, passed to the west or outside of Queen Charlotte Islands, calling at Nootka. Finding no despatches for him from England, he proceeded, *via* Monterey, to winter at the Sandwich Islands.

After the winter of 1793, Vancouver sailed north, direct to the Alaskan coast, to thoroughly examine those portions of the mainland coast southwards which he had not formerly surveyed. This work occupied the whole summer of 1794. It enabled him to report definitely that no navigable channel intersected the continent south of the latitudes which had been explored by Captain Cook and himself, and that the supposed hyperborean passage did not exist. He returned to Nootka in September, where he remained repairing his vessels until October. During that time he enjoyed the hospitality of the Spanish commander Alva (successor to Quadra), and exchanged courtesies with him.

No despatches having arrived from England or from the continent of Europe, both commanders at nearly the same date left Nootka for Monterey, where despatches would first arrive by the overland route. It was understood there that no alteration would be made from the wording of the convention of 1790; Vancouver, therefore, proceeded to England *via* Cape Horn. He reached his destination in October 1795, his mission having been highly successful; and he had the satisfaction of reporting that, during the long absence of four years and nine months, the *Discovery*, his flag-ship, had only lost one man by disease out of the complement of 100 men, and that the *Chatham*, his consort, had not lost one man either by illness or by accident.

"The Nootka difficulty" was not finally settled until another convention was held at Madrid in 1794, which resulted in an agreement being made, that "commissioners should meet, as soon as possible, on or near the spot where the buildings occupied by British subjects formerly stood, and there exchange declaration and counter-declaration as literally described in the document, which provided that, the preliminaries having been

complied with, the British officer shall unfurl the British flag over the land thus restored, as a sign of possession, and after these formalities the officers of the two crowns shall retire respectively to their people from the said port of Nootka."

The commissioners appointed to conclude the formalities sailed from Monterey, March 22nd, 1795. "By the morning of the 28th," the British officer, Lieut. Thomas Pierce of the marines, reports, "all the artillery were embarked, part on board his Catholic Majesty's ship *Activa*, and part on board of the *San Carlos* guardship. Brigadier-General Alva and myself then met, agreeably to our instructions, on the place where formerly the British buildings stood, where we signed and exchanged the declaration and counter-declaration for restoring those lands to his Majesty, as agreed upon between the two courts; after which ceremony, I ordered the British flag to be hoisted in token of possession, and the General gave orders for the troops to embark." The name of the island was changed to Vancouver.

No sooner had the Spaniards withdrawn from Friendly Cove, as the harbour was called, than the Indian Chief Maquinna transferred his subjects to the quarters which the troops had abandoned. No attempt was made to establish another settlement of white men at Nootka. Friendly Cove remains an Indian village as it was a hundred years ago; the only addition of white settlers is a storekeeper, who keeps on hand a small stock of goods of such sorts as are suited to the requirements of his Siwash (Indian) customers.

The sea-otter fur trade, however, continued to be carried on vigorously at Nootka, and was also prosecuted along the west coast generally. Traders were then at liberty to carry on their traffic in such ways as they considered most profitable; they sailed from cove to village, and in many instances took undue advantages of the unsophisticated natives. Intoxicating liquor of the vilest sort was freely introduced. Demoralisation and disease followed. The cupidity, greed of gratification, and the reckless improvidence of the natives, induced them to capture, in season and out of season, the sea-otters, which, notwithstanding their immense numbers, soon began to show the effect of indiscriminate and incessant slaughter.

The fur trade was carried on exclusively by sea until the year 1810, when the North-West Company, following up the explorations made in 1793 by Alexander Mackenzie (afterwards Sir Alexander), branched south by the Columbia river, and made the southern portion of that great water-course the principal route of trade and travel until 1821, when they amalgamated with the Hudson Bay Company; after which time that Company carried on the whole of the fur trade of British North America under their old name.

For about fifty years after the withdrawal of the Spaniards from Nootka, the Island of Vancouver was entirely in possession of the native tribes. In 1843, however, the Hudson Bay Company removed their headquarters from Fort Vancouver on the Columbia river to the south-eastern part of Vancouver Island, where they erected a fort and trading post, which at first was named Camosun, but soon afterwards, with its

name changed to Victoria, became the nucleus of the present city of Victoria.

The Company, expecting to profit from the immigration which had begun to come from the east to the lands near the Columbia river, obtained from the Imperial Government a grant or lease of the whole Island of Vancouver for colonisation purposes. The island was granted in January 1849 to the Company, together with its seas, and all mines belonging to it, for ever; subject only to the domination of the British Crown, and to the yearly rent of seven shillings, payable on the first day of every year. The Hudson Bay Company were to settle upon the island, within five years, a colony of British subjects, and dispose of the land for the purposes of colonisation at reasonable prices. Such lands as might be necessary for a naval station, and for other Government establishments, were to be reserved. Provision was made that, in the event of no colonisation being made at the end of five years, the grant should be forfeited.

It was next decided by the Imperial Government to form the island into a colony. Richard Blanshard was appointed Governor. He left England in 1849, but did not reach Victoria until 10th March 1850. He was received at the fort by the chief factor, James Douglas, and the officers of the Company, who, with the employes, assembled to hear the commission and proclamation of the newly-arrived Governor read. Governor Blanshard then returned to the ship, as there was no Government house, inn, or lodging provided on land to receive him.

The position which Governor Blanshard came to fill did not come up to his expectations, so next year he resigned, and returned to England in 1851. He was succeeded by Chief Factor James Douglas (afterwards Sir James), who at the same time retained his former position under the Hudson Bay Company. At the time of his appointment as Governor of the Colony of Vancouver Island (1851) he was raised to the dignity of C.B.

The government of the colony was autocratic until 1856, being administered by Governor Douglas and a Council, two of whom were nominated by Governor Blanshard. An election of seven residents was held in 1856, to form a parliament to represent the people in the local legislature. This arrangement was continued until 1859, when the second five years' lease of the island to the Hudson Bay Company terminated.

In consequence of the gold excitement in 1858, which brought thousands of miners to the Fraser river country, the Home Government considered it advisable to form the mainland into a new colony, to be named British Columbia. Governor Douglas was offered the appointment of Governor of the new colony in addition to that of Governor of Vancouver Island, on the condition that he would sever all connection with the Hudson Bay Company. To this he agreed, and his commission as Governor of British Columbia was proclaimed 19th November 1858; he took the oath of office the same day. New Westminster was proclaimed the seat of Government of the new colony of British Columbia.

The dual administration continued under Governor Douglas until his



term of office expired in 1864, when he retired. He was knighted in 1863. Great improvements were made in the city of Victoria during his term of office. It grew from a mere trading post to a city of commercial importance. Large settlements were opened up in the surrounding country. Farther north, on the east coast of the island, the Nanaimo coal mines were opened. Public buildings were erected in 1859. Those have done good service ever since, but are now being replaced by a magnificent pile of buildings, probably the finest combination of parliamentary and departmental buildings to be found on the continent of America. They are built of white igneous sandstone, which hardens on exposure to the air, and along with the exquisite design of the architect they present a handsome appearance. The legislature in 1893 voted \$600,000 to meet the cost of the building.

The maintenance of two colonial governors, with their respective staffs, was found to be rather expensive for the revenues of the separate provinces to sustain; therefore the Colonies were united in 1866. Victoria was voted to be the seat of government for the united colonies by a majority of the representatives of both. This was ratified by an Imperial Act of her Majesty, and Victoria remains the capital of British Columbia. Governor Seymour, then at New Westminster, was transferred to Victoria. At his death he was succeeded by Sir Anthony Musgrave, who held office until 1871, when the Province of British Columbia was merged into the Dominion of Canada.

At the time of the confederation of British Columbia with the Dominion, the building of the graving dock at Esquimalt and the construction of a railway from Esquimalt to Nanaimo were arranged for. The railway was completed in 1887, and Esquimalt now possesses one of the best and most substantial dry docks on the Pacific Coast. The harbour, the naval station of the British fleet on the Pacific, is about three miles long by two wide, and has an average depth of about eight fathoms, with excellent holding-ground for anchorage. The dry dock, which was nearly three years in construction, is built of sandstone imbedded in cement; it is 457 feet long, 57 wide, and 27 deep. The machinery connected with the water-gates, valves, and pumping apparatus is of the latest and most perfect types of mechanical and engineering skill.

Vancouver Island is celebrated for the excellent quality of its coal; for the past year (1894) the output was 1,012,053 tons. The exports were 827,642 tons, of which San Francisco and California took 649,110 tons; the balance, with less than two weeks' production on hand at the end of the year, was shipped to Washington Territory, Alaska, to the Hawaiian Islands, etc. The northern end of the island overlies extensive coal measures. At Quatsino, near the mouth of the inlet of the same name, a new town and settlement have recently been established. Near at hand the outcrops of coal and borings give a prospect of an abundant supply of excellent coal.

A mere reference need only be made to the inexhaustible supply of edible fishes which swarm along the shores and on the deep-sea fishing banks. Unfortunately, but little has been done towards bringing this harvest of the sea to market, with the exception of the salmon. The







timber supply of the island is very large, and much of it of excellent quality, including extensive groves of cedar and Douglas pine, which flourish on the coast down to the limit of tidal water.

Judging from the newspaper reports respecting the work which is being done at the goldfields of Alberni, it appears that Vancouver Island holds a foremost place in the mineral regions of British Columbia. Professor W. J. Sutton, formerly provincial assayer, and more recently Assistant-Professor of Geology and Mineralogy in the Michigan (U.S.) School of Mines, has handed into the Minister of Mines a report, from which the following are extracts:—

"In taking a general survey of the country under consideration before entering into specific details, a glance at the map of Vancouver Island will show the rugged, mountainous nature of its interior. The mountains of Vancouver Island are comprised of four great ranges or systems of mountains within what has been called the Vancouver range, the most westerly of the four great ranges in British Columbia, forming the cordillera belt. Commencing on the east, we have first the Rocky Mountains, then the Gold range, next the Coast range, and, finally, the Vancouver range, all running more or less parallel in a north-westerly and south-easterly direction.

"The Vancouver and Gold ranges have many features in common in their auriferous schists and altered volcanic rocks. The Gold range, being composed of a number of minor ranges, namely, the Cariboo, Selkirk, Purcell, and Columbia ranges, has thus far produced most of the mineral wealth of the province of British Columbia. The Vancouver range is the north-western boundary of the continent of North America, as there is only a narrow submarine plateau extending beyond it, and then a quick descent into the azure depths of the Pacific.

"Comparatively little is yet known regarding the geology of the interior of Vancouver Island, partly owing to its rugged nature and thick undergrowth, partly to the limited amount of geological work thus far undertaken. The complications of structure presented can only be satisfactorily worked out by a comprehensive survey of the whole island, which properly comes under the purview of the Geological Survey of Canada, and I would respectfully draw your attention to the needs of the province in that respect.

"The Vancouver range consists for the most part of an enormous series of eruptive rocks, interbedded with limestone, argillite, quartzite, etc. This great mass of volcanic material and interbedded sedimentary rocks has been grouped together, and provisionally called the Vancouver series, by Dr. Selwyn. The series amounts to many thousands of feet in thickness, and will most likely be found to embrace not only Triassic and Carboniferous rocks, but others even lower in the geological scale. The limestone portion alone attains a thickness of several thousand feet, and Dr. Dawson has suggested that the series should be limited to the Triassic rocks, when they shall have been distinctly separated. The whole region has suffered great disturbance. Volcanic outflows on an enormous scale have occurred at repeated intervals, long periods intervening, during which the interbedded sedimentary rocks accumulated. The amount of volcanic breccia and tuff is also a remarkable feature, a large exposure of which may be seen along the Alberni road at Cameron lake. All this great series has undergone extensive metamorphism. The limestones have become highly crystalline, and contain few fossils. The argillites have become semi-crystalline and more or less chloritic schists. The eruptives, although originally basaltic and trachytic lava-flows, have undergone such alterations that we have now diabase, diorite, felsite, etc. A large propor-

tion might be called greenstone, their greenish appearance being due to the alteration products, such as chlorite, viridite, etc. Some of these extremely altered eruptives might, from a lithological standpoint, be regarded as very low down in the geological scale.

"The interior of Vancouver Island lying north of Cowichan lake and down to Alberni appears to be the remnant of a high, elevated plateau, the mountain peaks now remaining having an elevation of about 4000 feet, which is about the average height of most of the principal mountains of the island, the highest, Victoria Peak, having an elevation of about 7484 feet.

"Lying unconformably on the Vancouver series is quite a large area of Cretaceous rocks, forming a sort of fringe along the east coast of Vancouver Island, and embracing the coal areas of Cowichan, Nanaimo, and Comox.

"At the head of Alberni Canal there is a basin of sedimentary strata, consisting of sandstones, conglomerates, and shales, which have been classed as Cretaceous, but from observed lithological differences I am inclined to question whether they belong to the same horizon as the coal-bearing area of the east coast. A shaft was sunk in the shale near the head of the canal about seventeen years ago, but no distinct coal seam was exposed, although the shale was highly carbonaceous. I came across outliers of these sandstones and shales in the China creek basin, to which I shall have occasion to refer later on. I have also seen similar sandstone and conglomerate on the border of Cowichan lake.

"It is interesting to note in this connection that almost every creek and river on Vancouver Island shows at least one or two colours to the pan. Leech river, in particular, yielded a considerable quantity of gold to the hardy miners of the early sixties, variously estimated at from one to two hundred thousand dollars.

"China creek was worked for its alluvial gold as far back as 1862, principally by Chinamen, and has yielded about forty thousand dollars by the most primitive methods—the pan, shovel, rocker, and sluice-box. A good deal of gold has also been taken out of Gold river by the Chinese, but nothing definite can be obtained regarding its yield. The black sand along the north shore, especially at Cape Cormorant and Cape Scott, contains considerable fine gold similar to that found along the coast of Oregon and California.

"All the streams which have their sources in the auriferous belt under consideration show strong colours to the pan. I may mention the following: Cameron, Nanaimo, Nitinat, Cowichan, and Franklin rivers, Chinn, Shaw, and Granite creeks. It must not be forgotten that placer gold has been naturally concentrated by an extensive erosion of the surrounding country, and it is not to be entirely depended upon as an index to the extent of the gold yet remaining in the hills.

"Along the trail from the Alberni settlement, several exposures of syenite can be seen. This syenite extends over a large area, and forms, I think, the archæan floor upon which the Vancouver series was laid; wherever met with it has been found to underlie all the other formations. It is a typical syenite, showing the hornblende in well-defined crystals, but considerably altered. It contains very little mica and a small proportion of quartz, although quartz occurs locally in sufficient abundance to make it a hornblende granite. The syenite occurs as a bedrock along nearly the entire length of Granite creek, from which it has derived its name through the miners regarding it as granite.

"Small outliers of the sandstone previously mentioned are exposed along the trail, and it no doubt originally covered the whole valley, but has since been removed by denudation. It is overlaid with shale on China creek, and is exposed along the beds of Mosquito and M'Laughlin creeks, extending into the foothills,

and also forms a rim around Mount Patl Patlicant. There is a fine exposure of these strata at a high fall on M'Laughlin creek, where there is a perpendicular drop of 150 feet. Here they appear to lie horizontally, but passing round Mount Patl Patlicant to the west they form a spiral, and crop out near the top of the mountain on the south side. A good exposure showing this twist is on a bluff at the head of Child's creek. The most remarkable exposure of the sandstone is at its contact with the Vancouver eruptives, well seen in the bed of China creek. Here the sandstone dips under eastward at an angle of 60 degrees, which may be explained as a complete overthrow of the strata, or a reversed fault—the eruptives being supposed to antedate the sandstone. There is about two feet of fluccan, and the sandstone is very much indurated at the contact. The eruptives are also very much altered. The deepest section of these sedimentary strata amounts to about 600 feet of sandstone and 400 feet of shale. No evidence of coal has anywhere been seen.

"Mount Patl Patlicant has a capping of eruptive rock, probably a phonolite, which rests upon the shale above mentioned.

"The gold belt on China creek lies east of this sandstone, the formation being an almost typical section of the Vancouver series, consisting of diabasic, dioritic, and felspathic rocks, more or less schistose, with interbedded limestone, argillite, and quartzite. These eruptive rocks have undergone remarkable alteration, especially in the neighbourhood of Mineral creek, where they have become greenish grey schists, showing their eruptive origin only under the microscope.

"On the Alberni claim two veins of gold quartz have been exposed. The lower vein has about two feet of crystalline quartz, containing free gold disseminated through it in fine particles, and in some places plainly visible to the naked eye. The gold is associated with small grains of blende (black jack) in a somewhat peculiar manner, so that the presence of blende is an index to the occurrence of gold. The gold shows signs of crystallisation when highly magnified. The vein dips about 65 degrees to the east, with a strike of north 15 degrees east, and conformable with the bedding or foliation of the country-rock, and therefore may be classed as a segregated vein. The upper exposure of gold-bearing quartz is a narrow vein about a foot in width, cutting across the formation about north-east. The gold occurs in the same manner as in the other vein.

"The country rock of the Alberni claim is a greenish-grey schist, being an igneous rock highly metamorphosed through hydro-thermal agencies.

"Beyond these I have mentioned, very little work has been done on the claims in this section, so that it would be premature to form any definite conclusions regarding the permanency of the auriferous deposits. The majority of the veins are interbedded or 'segregated' veins, and have the appearance of being of somewhat lenticular character, similar to the quartz veins in the Alleghany mountains and a large proportion of the gold-bearing veins of California. They are good types of segregated veins, and contain the usual constituents—gold, pyrites, blende, galena, and chalcopryrite.

"Mineral creek follows the line of an interbedded stratum of calcareous material, or impure limestone, heavily studded with pyrites, passing through its entire length, for this limestone is softer than the neighbouring rock, and therefore more easily eroded by the watercourse.

"A number of other creeks in the neighbourhood were observed likewise following down the interbedded strata of limestone so common to that section. . . . The Golden Eagle basin, which is about ten acres in extent and completely surrounded by high, precipitous mountains, 4000 to 5000 feet in height, is beau-

fully situated for a stamp mill or other works which might be needed in working the mines, and there is a plentiful supply of water and timber. The Golden Eagle is about half a mile from the cabin, and is reached by a gradual ascent of about 500 feet up the foot of Mount Saunders, which is covered with heavy debris from the mountain.

"The quartz vein upon which the work has been done is exposed along the ridge of a 'hog's back,' with snowslides on either side. The ridge is covered with timber, which serves as a protection from the heavy snowslides that would otherwise be a constant menace.

"The hog's back appears to be an intrusive boss of diorite which has undergone local metamorphism. At a short distance from the vein the hornblende of the diorite has undergone alteration to mica. Immediately adjoining the vein the mica diminishes, so that it becomes a leached felspathic rock which might be classed as a felsite. The vein has a banded structure, and has every appearance of being filled by lateral secretion and deposition, and possibly some replacement of the country-rock with vein matter.

"The ravine where the claim (King Solomon) is situated lies between Mount Saunders and Mount M'Quillan, at an elevation of nearly 4000 feet above sea-level, so that snow remains in the basin the year round. From what I was able to see, I should judge that the vein is a narrow seam along the side of a dyke. I was informed that it was widening below.

"The country-rock consists of schists cut through by numerous felsite dykes, which can be plainly seen running up the mountain side. These igneous injections produce conditions favourable to the concentration of the precious metals—in fact, it has been contended that the presence of gold in veins is always in conjunction with intrusive rocks, that the gold has been carried up with the outflow of these eruptive rocks. Without fully accepting this theory, it is generally believed by mining men that some eruptive action is essential to produce the necessary conditions for the concentration of metals in veins. The occurrence of auriferous deposits in conjunction with dykes is particularly exemplified throughout California, and, apart from any theory in connection therewith, we may naturally expect to find the same condition here.

"It is now well established that the metals occurring in veins in the form of ores have been deposited by the chemical solution of their ingredients from the surrounding country-rock. The principal difference of opinion, over which there has lately been a warm controversy, is with regard to the stress laid upon lateral secretion, or the ascension of the mineral-bearing solutions from great depths. . . .

"A number of claims have also been staked off in juxtaposition to the King Solomon, upon which very little work has been done. The ridge on the east side of the King Solomon Basin, of which Hanson Heights is the summit, is very much stained with iron oxide, due to the oxidation of the sulphurets with which the whole region is heavily charged. Hanson Heights is a highly crystallised diorite, being the same as the summit of Mount Saunders.

"On the trail, below the cabin on M'Quillan creek, is a notable outcrop of jasper or jaspillite—a name given to the rock by Dr. Wadsworth. Some of this jaspillite is heavily charged with hematite, and is identical with the jaspillite occurring in association with the great iron deposits of Northern Michigan. This is the only place where I found it *in situ*, although I met with float pieces all over the district. It may only occur as an inter-bedded layer similar to the quartzites in that locality. Adjoining it on the one side is a large bed of argillaceous schist, somewhat ferruginous, and on the other side are crystalline rocks.

"In passing down Alberni Canal from the settlement, carbonaceous shale can be seen exposed along the shore at the old Alberni sawmill site, lying almost horizontally. Farther along the shore of the canal, about a mile southwards, syenite crops out for a short distance, and is then replaced by a blackish, almost aphanitic diorite, which constitutes the body of Copper mountain. This formation extends along the shore down to a short distance below where the Esquimalt and Nanaimo railway boundary line crosses the canal, where syenite reappears and extends down to Hiwatches or Franklin river.

"A good contact of this blackish, fine-grained diorite with the syenite may be seen on China creek, the syenite dipping under the diorite westward at an angle of about 55 degrees.

"A most remarkable body of limestone crops out in what I have called Limestone mountain, at the head of Hiwatches river. There is an abrupt escarpment, almost perpendicular, of not less than 1000 feet of crystalline limestone, showing well the lines of stratification, and dipping about 15 degrees to the south. I did not succeed in obtaining any fossils, except a few crinoidal stems. A similar mass of the same kind of limestone occurs on the west side of Mount Douglas, showing a good exposure on the east side of Hidden lake, the vertical section being about 500 feet. All these limestones are highly crystalline and more or less dolomitic. They bear a great resemblance to several other large deposits on the island, such as at Horne lake, Kennedy lake, Nootka sound, and on Texada island. . . .

"In one spot on Granite creek I came across some chalcopyrite associated with molybdenite. It is interesting to note the common occurrence of molybdenite throughout British Columbia in association with copper ores; it has been found in numerous places but only in small quantities. . . ."

From the foregoing it will be apparent that Vancouver Island is the western bulwark of the Dominion of Canada; and that, as the Province becomes better settled and its resources more fully developed, it will, along with the island, not only maintain but exceed in value and importance its present high position.